UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00922

October 22, 2003

Mr. Robert E. Willis
Chief, Environmental Resources Branch
Department of the Army
Portland District, Corps of Engineers
Attn: Steve Helm
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Westmoreland Park Aquatic Habitat Restoration Project, Crystal Springs Creek, Willamette River, Multnomah County, Oregon

Dear Mr. Willis:

Enclosed is a biological opinion (Opinion) prepared by the NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act that addresses the proposed Westmoreland Park Aquatic Habitat Restoration Project on Crystal Springs Creek in the Willamette River Basin, Multnomah County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize the continued existence of Lower Columbia River (LCR) steelhead (*Onchorynchus mykiss*) or LCR chinook salmon (*O. tshawytscha*). As required by section 7 of the ESA, this Opinion includes reasonable and prudent measures with terms and conditions that are necessary and appropriate to minimize the potential for incidental take associated with this action.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600. The Willamette River and tributaries have been designated as EFH for chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*).

If you have any questions regarding this consultation please contact Ron Lindland of my staff in the Oregon Habitat Branch, at 503.231.2315.

Sincerely,

Russell M Strach for

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Westmoreland Park Aquatic Habitat Restoration Project
Crystal Springs Creek
Willamette River Basin, Multnomah County, Oregon

Agency:	Army Corps of Engineers, Portland District
Consultation Conducted By:	NOAA Fisheries, Northwest Region
Date Issued:	October 22, 2003
Issued by:	Russell M Strach for D. Robert Lohn Regional Administrator
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1. INTRODUCTION

1.1 Consultation History

On July 18, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter dated July 15, 2003, with a biological assessment, and engineering drawings from the Corps of Engineers (COE) requesting formal Endangered Species Act (ESA) consultation on the effects of the proposed Westmoreland Park Aquatic Habitat Restoration Project in Crystal Springs Creek on Lower Columbia River (LCR) steelhead (*Oncorhyncus mykiss)* and LCR chinook salmon (*O. tshawytscha*). The COE also requested Essential Fish Habitat (EFH) consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for coho salmon (*O. kisutch*). The COE determined that the proposed action is "likely to adversely affect" (LAA) LCR steelhead and LCR chinook salmon.

NOAA Fisheries listed LCR steelhead as threatened under the ESA on March 19, 1998 (63 FR 13347). NOAA Fisheries listed LCR chinook salmon as threatened on March 24, 1999 (64 FR 14308). NOAA Fisheries issued protective regulations for LCR steelhead and LCR chinook salmon under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The objective of this biological opinion (Opinion) is to determine whether implementing the Westmoreland Park Aquatic Habitat Restoration Project in Crystal Springs Creek is likely to jeopardize the continued existence of LCR steelhead or LCR chinook salmon.

The objective of the EFH consultation is to determine whether the proposed action may adversely affect designated EFH for coho salmon and chinook salmon, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

1.2 Proposed Action

The proposed action is the partial funding by the COE of the Westmoreland Park Aquatic Habitat Restoration Project, under authority provided in Section 206 of the Water Resources Development Act of 1996. The City of Portland is the local sponsor of the project, and would also provide part of the funding. The project is in T1S, R1E, Sections 50 and 57 along approximately 1,200 feet of Crystal Springs Creek between Bybee Boulevard and Lambert Street and along approximately 500 feet of the creek between Tacoma Street and Umatilla Street. Crystal Springs Creek is a tributary to Johnson Creek that enters the Willamette River near Milwaukie, Oregon. Implementation of the proposed project would include the following activities: (1) Removal of existing concrete streambank protection structures along approximately 1,200 lineal feet on both sides of Crystal Springs Creek and along the perimeter of the existing duck pond within that stream reach; and recontouring of the streambanks in this same stream reach; (2) construction of a new, meandering stream channel through the existing duck pond reach, and placement of approximately 8,000 cubic yards of fill material and planting

of wetland vegetation to create wetlands in the rest of the duck pond area; (3) revegetation of a 30-foot wide riparian area along each side of Crystal Springs Creek between Bybee Boulevard and Lambert Street by planting willows, conifers, and native shrubs; (4) excavation of approximately 3,500 cubic yards of material to create a 0.23 acre wetland area just upstream from Lambert Street; (5) placement of large woody debris consisting of conifers, which are a minimum of 18-inches in diameter and 20 feet long with rootwads attached, at selected locations in the stream channel and in the wetland areas along the stream reach between Bybee Boulevard and Lambert Street; (6) removal of approximately 1,000 cubic yards of fine sediment from the stream channel to create two or three pools and improve substrate composition; (7) removal of existing 44 to 48- inch diameter culverts under Tacoma Street, Tenino Street, Umatilla Street and a private driveway and replacement with bottomless arch structures, 10 to 12 feet wide at the bottom of the arch; (8) construction of a boardwalk to access the newly created wetland area in the existing duck pond area; (9) moving the existing trail along the west bank of the creek such that it is from 10 to 40 feet further from the creek and placement of gravel on the new trail alignment; and (10) removal of the existing footbridge approximately 300 feet upstream from Lambert Street.

All instream work areas would be temporarily dewatered by diverting stream flow around each site. Any fish stranded in the dewatered areas would be salvaged by appropriate means and returned to the creek. Silt fencing and hay bales will be placed as appropriate to minimize sediment transport to the creek from the areas disturbed by construction. Concrete from existing structures along the streambanks and duck pond would be hauled to an appropriate landfill, recycling center, or upland disposal site. No existing trees will be removed. A complete sequence of construction activities is listed on page 5-7 of the BA and is incorporated herein by reference. Construction activities within Westmoreland Park and the culvert replacements at Umatilla Street and the private driveway would occur in 2004, while culvert replacements at Tacoma and Tenino Streets would occur in 2005.

Following is a summary of conservation measures that will be followed according to the BA:

1. All in-stream work will be conducted during the preferred in-water work period for that portion of the Johnson Creek watershed where the proposed project would be (July 15-August 31).

2. Project boundaries and clearing limits will be clearly fenced or flagged before any grading or excavation.

3. Trees to be protected during project construction will be fenced at the dripline or wider to prevent damage to their roots during construction

4. Equipment will not be driven in the creek, except as the existing channel bed is isolated from flowing water via a water diversion.

5. Construction staging may occur within 150 feet of the creek due to the need to construct most of the features within the creek. However, the staging area will be fully contained through use of silt fencing, hay bales, and other barriers to prevent runoff of pollutants into the creek or stormwater drains.

6. Equipment will be inspected and cleaned daily of grease and other pollutants and leaks and repaired, if necessary, before leaving the staging area.

7. No treated wood will be used for any structure that may contact flowing water.

8. Any construction discharge water, such as in the duck pond area will be treated and released to a percolation pond or stilling basin before release to the creek.

9. Fish passage will be provided via the temporary water diversion

10. Fish trapped within the isolated work areas will be captured and released using appropriate methods, with supervision of a fishery biologist and agency personnel, as available.

11. The site will be stabilized during any significant break in work (such as more than 72 hours) and within 48 hours of completion of final grading.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The listing status and biological information for LCR steelhead are described in Busby *et al.* (1995) and Busby *et al.* (1996). Listing status and biological information for LCR chinook salmon are described in Myers *et al.* (1998).

Johnson Creek provides spawning, rearing, and migratory habitat for both adult and juvenile life stages of LCR steelhead and LCR chinook salmon. Fish sampling investigations conducted by the Oregon Department of Fish and Wildlife (ODFW) in 2002 found juvenile rainbow (steelhead) trout and juvenile chinook salmon in Crystal Springs Creek (Graham *et al*. 2002).

Essential features of the adult spawning, juvenile rearing, and adult and juvenile migratory habitats for the species are substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions (50 CFR 226.212). The essential features that the proposed project may affect are

safe passage conditions, substrate, water quality, cover/shelter, space, and riparian vegetation resulting from project activities.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations combined with the Habitat Approach (NMFS 1999): (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species and whether the action is consistent with the available recovery strategy; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or destroy or adversely modify critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or result in the destruction or adverse modification of critical habitat. If either or both are found, NOAA Fisheries will identify reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with information considered in its decision to list LCR steelhead and LCR chinook salmon for ESA protection then considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for LCR steelhead and LCR chinook salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration and juvenile rearing. LCR steelhead and LCR chinook salmon survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while removing adverse impacts of current practices. In conducting analyses of habitat-altering

actions, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a "habitat approach" to its analysis (NMFS 1999). The current status of UWR steelhead, based upon their risk of extinction, has not significantly improved since the species were listed.

2.1.4 Environmental Baseline

In step 2 of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area to the species' current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area includes, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). Therefore, the action area for this consultation includes the streambed, streambanks, and riparian area of Crystal Springs Creek from the Bybee Boulevard crossing downstream to the confluence with Johnson Creek.

Crystal Springs Creek is a small, springwater-fed stream, originating at several springs near the present site of Reed College and the Crystal Springs Rhododendron Garden. According to the BA, historically, Crystal Springs Creek and the present Westmoreland Park area were a complex system of braided channels and wetlands that may have periodically been a flood channel of the Willamette River. In the mid-1800s, before urbanization, the Johnson Creek watershed and Crystal Springs Creek were extensively timbered with fir, cedar, and hemlock with an understory of vine maple and hazel. During the late 1800s the wetlands were drained and the creek channelized for farming and residential development purposes. Crystal Springs Lake and Reed Lake were artificially created by damming the creek, likely to provide water supply and for aesthetic reasons.

Currently, Crystal Springs Creek is confined to a uniform channel with minimal aquatic habitat and significant depositions of fine sediments in the creek. Only a small number of natural wetlands are present along its course, and while it may provide some low to moderate quality rearing habitat for juvenile salmonids, the lack of habitat diversity and the presence of fine sediments in the substrate have significantly reduced its value as fish habitat.

Environmental baseline conditions within the action area were evaluated for the subject action at the project level and watershed scales. This evaluation was based on the matrix of pathways and indicators (MPI) described in *Making Endangered Species Act Determinations of Effect for Individual or Groups of Actions at the Watershed Scale* (NMFS 1996). This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

In the Crystal Springs Creek drainage only the peak/base flow indicator was rated as properly functioning. Four indicators (sediment, chemical contamination/nutrients, width/depth ratio, and

floodplain connectivity) were rated as functioning "at risk". The other 13 indicators were rated as not properly functioning.

The project area encompasses approximately 1200 feet of Crystal Springs Creek in Westmoreland Park between Bybee Boulevard and Lambert Street and a 500 foot reach of creek between Tacoma Street and Umatilla Street downstream of the park. The stream segment in Westmoreland Park is currently bounded on both sides by 16-inch high and 12-inch wide concrete berms. Approximately 700 feet of this reach consists of a wide, shallow duck pond which is backed up by a wood and concrete sill at its downstream end. According to the BA, water temperature at the headwater springs ranges from 50-55 degrees year-round. However, after flowing through the lakes and the duck pond, water temperatures as high as 77 degrees have been recorded at the mouth of Crystal Springs Creek. The riparian area and floodplain in the park are currently dominated by non-native species including lawn grasses, flowering cherries, and hybrid roses. Heavy use of the duck pond by waterfowl has resulted in high (up to 5100 colonies per 100 mL) fecal coliform counts in the creek. In the stream reach downstream from the park, according to the BA, water velocities through the existing culverts under Tacoma, Tenino, and Umatilla Streets exceed 2 feet per second, while velocity through the culvert under the private driveway exceeds 4 feet per second. These water velocities are thought to prevent upstream passage by juvenile salmonids.

2.1.5 Effects of Proposed Action

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of the proposed action on listed fish and their habitat.

Juvenile LCR steelhead and LCR chinook salmon, may be present in the project area of Crystal Springs Creek even during the preferred in-water work period between July 15 and August 31. If juvenile LCR steelhead and LCR chinook salmon are present, they may be affected by the proposed project due to: (1) Potential stranding of juvenile fish when in-water work areas are isolated before beginning construction activities; (2) direct or delayed mortality due to handling associated with removal and relocation from the isolated in-water work areas; and (3) potential increase in turbidity in Crystal Springs Creek in the project area and downstream as a result of construction activities.

If any LCR steelhead or LCR chinook salmon are present in the project area of Crystal Springs Creek during construction, they may be injured or killed by construction activities. Isolation of in-water work areas could cause stranding of fish in areas to be isolated. Juvenile LCR steelhead and LCR chinook salmon could also be injured or killed by contact with material used to isolate work areas as it is being installed or from handling necessary to capture and release fish from the isolated areas. However, because of the timing of the work and because summer water temperatures are warm in Crystal Springs Creek in the project area, it is expected that few, if any, juvenile LCR steelhead or LCR chinook salmon will be present in the project area. If 100 each of ESA-listed juvenile LCR steelhead and LCR chinook salmon may be captured and

released during work area isolation, and assuming a 5% direct or delayed mortality rate for those fish that are captured and relocated, the fish salvage and removal associated with the proposed project could result in mortality of up to five of each species of ESA-listed salmonids.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1998).

Fish that remain in turbid, or elevated total suspended solids, waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade-off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Excavation activities to create a new meandering stream channel through the existing duck pond area, to create a wetland area upstream from Lambert Street, to remove and replace existing culverts, to remove sediment deposits and create pools in the existing stream channel, and to add fill material to the duck pond area to create wetlands may increase turbidity in Crystal Springs Creek. However, because instream work areas will be isolated from flowing water during construction work, sediment transport and stream turbidity are expected to be minimized.

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of heavy equipment requires the use of fuels and lubricants which, if spilled in the stream channel or in the adjacent riparian area, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs) which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). The potential for pollutants to enter the stream will be minimized by

staging fuels and equipment in approved areas, by having a spill control plan, and by having spill control materials on site.

All areas that are disturbed by construction activities associated with the proposed project will be planted with native varieties of trees, shrubs and seed mix. Over time, the plantings will improve habitat conditions including microclimate (light, temperature, humidity), contribution of organic matter and woody debris to the channel, and resistance to erosion through root strength (Gregory *et al*. 1991. Degree of shading of streams is a function of the structure and composition of riparian vegetation (Gregory *et al*. 1991). As the vegetation matures over time, it will contribute to the improvement of habitat functions. There are no adverse effects to salmonids from the planting of riparian vegetation. No existing large trees will be removed in the action area.

Potential beneficial effects resulting from the proposed restoration project include: (1) Increased complexity of instream habitat in Crystal Springs Creek resulting from creation of a meandering stream channel, placement of large woody debris, excavation of pools, and creation of new wetland areas; (2) decreased water temperature over time from improvement of riparian vegetation, stream shading, and creation of wetlands; (3) increased off-channel rearing and refuge habitat for juvenile LCR steelhead and LCR chinook salmon from creation of wetlands; and (4) improved passage conditions for both adult and juvenile LCR steelhead and LCR chinook salmon resulting from replacement of existing culverts at the private drive and Tacoma, Tenino, and Umatilla Streets with bottomless arch structures.

2.1.6 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." This is step 4 in NOAA Fisheries’ analysis process. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities, are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action.

NOAA Fisheries is not aware of any specific future non-federal activities within the proposed action area that would cause greater impacts to listed species than presently occurs. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

2.1.7 Conclusion

The final step in NOAA Fisheries’ approach to determine jeopardy is to determine whether the proposed action is likely to appreciably reduce the likelihood of species survival or recovery in the wild. NOAA Fisheries has determined that, when the effects of the proposed Westmoreland

Park Aquatic Habitat Restoration Project addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, it is not likely to jeopardize the continued existence of LCR steelhead or LCR chinook salmon.

These conclusions are based on the following considerations: (1) All in-water work will be completed within the preferred in-water work period of July 15 to August 31; (2) very few, if any, juvenile LCR steelhead or LCR chinook salmon are expected to be present in the project area of Crystal Springs Creek during the in-water work period; (3) downstream movement of sediment into Crystal Springs Creek from construction activities is expected to be minimal because areas where excavation, fill, or culvert removal/replacement activities occur will be isolated from flowing water; (4) streambank areas disturbed by project activities will be mulched and planted with native grasses, shrubs, and trees; (5) complexity of rearing habitat for LCR steelhead and LCR chinook salmon in Crystal Springs Creek is expected to be increased as a result of creation of a meandering channel, placement of large woody debris, and excavation of pools; (6) elimination of the duck pond, planting of riparian vegetation, and creation of wetlands are expected to reduce water temperatures and improve water quality in the project area of Crystal Springs Creek over time; (7) off-channel rearing and refuge habitat for juvenile LCR steelhead and LCR chinook salmon is expected to be increased from creation of wetlands; (8) passage conditions for both adult and juvenile LCR steelhead and LCR chinook salmon will be improved by replacement of existing culverts at the private drive and Tacoma, Tenino, and Umatilla Streets with bottomless arch structures; and (9) the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.9 Reinitiation of Consultation

This concludes formal consultation on this action in accordance with 50 CRF 402.14(b)(1). Reinitiation of consultation is required: (1) If the amount or extent of incidental take is exceeded; (2) if the action is modified in a way that causes an effect on the listed species that was not previously considered in the BA and this Opinion; (3) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; (4) a new species is listed may be affected by the action; or (5) new critical habitat rulemaking results in the designation of critical habitat that may be affected by the action (50 CFR. 402.16).

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include

significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of LCR steelhead and LCR chinook salmon because of harm caused by increased sediment levels, increased pollutant levels, limited riparian habitat disturbance, and the potential injury or death of individuals during isolation of in-water work areas. Based on the expected low numbers of juvenile LCR steelhead and LCR chinook salmon in Crystal Springs Creek at the Westmoreland Park Aquatic Habitat Restoration Project site at the time in-water work is conducted, the potential for take is low. Handling of juvenile steelhead during the work area isolation process and transfer of fish back to Crystal Springs Creek may result in incidental take of individuals if adequate water quality allows juvenile salmonids to be present during the construction period. NOAA Fisheries anticipates incidental take of up to 100 juveniles each of LCR steelhead and LCR chinook salmon, and mortality of up to five of each species. The amount of incidental take associated with other parts of the action covered by this Opinion is unquantifiable in the short term, and is not expected to be measurable as long-term effects on habitat or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to the proposed action covered by this Opinion, best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable." Based on the information in the BA and other information provided by the COE, NOAA Fisheries anticipates that an unquantifiable amount of incidental take could occur as a result of the habitat altering actions covered by the Opinion. The extent of the incidental take is limited to the project area. In the long term, survival and safe passage conditions for juvenile LCR steelhead and LCR chinook salmon will be improved.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions for the exemption in section 7(a)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to require the grantees to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the

oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize the amount or extent of take of listed fish resulting from implementation of the action addressed in this Opinion. These reasonable and prudent measures would also avoid or minimize adverse effects to designated critical habitat.

The COE shall:

1. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of avoiding or minimizing incidental take from permitted activities.

2. Avoid or minimize incidental take from construction-related activities by applying permit conditions that require completion of restoration actions with minimum harm to aquatic and riparian systems.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary and are applicable to more than one category of activity. Therefore, terms and conditions listed for one type of activity are also terms and conditions of any category in which they would also minimize take of listed species or their habitats.

1. To implement reasonable and prudent measure #1 (monitoring), the COE shall ensure that:

a. Salvage notice. The following notice is included as a permit condition.

> NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

b. Written planning requirements. Before beginning any work below bankfull elevation,[1] the grantee will provide a copy of the written plans for pollution and erosion control and site restoration to the Oregon Office of NOAA Fisheries at the following address. Plan requirements are described below.

> Oregon State Director
> Habitat Conservation Division
> National Marine Fisheries Service
> **Attn: 2003/00922**
> 525 NE Oregon Street
> Portland, OR 97232

c. Implementation monitoring report required. The grantee submits an implementation monitoring report to the COE and to NOAA Fisheries, at the address above, within 120 days of completing all in-water work. The monitoring report will describe the grantee's success meeting his or her permit conditions.

i. If the in-water work will not be completed by January 31 following the year during which consultation was completed, the grantee shall submit a report to the COE and to NOAA Fisheries by January 31 saying why the in-water work was not complete.

ii. If the monitoring report or explanation of why work was not completed is not received by the COE and NOAA Fisheries by January 31, NOAA Fisheries may consider that a modification of the action that causes an effect on listed species not previously considered and causes the incidental take statement of the Opinion to expire.

[1] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

iii. Submit a copy of the monitoring report or explanation of why work was not completed to the Oregon Office of NOAA Fisheries, at the address above.

d. Implementation monitoring report contents. Each monitoring report will include the following information:

i. Project identification

(1) Grantee name, permit number, and project name.

(2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.

(3) COE contact person.

(4) Starting and ending dates for work completed.

ii. Habitat conditions. Photos of habitat conditions at the project and any compensation site or sites, before, during, and after project completion.[2]

(1) Include general views and close-ups showing details of the project and project area, including pre and post construction.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Site restoration.

(1) The name and address of the party(s) responsible for meeting each component of the site restoration plan.

(2) Performance standards for determining compliance.

(3) Any other pertinent requirements such as financial assurances, real estate assurances, monitoring programs, and the provisions for short and long-term maintenance of the restoration.

(4) A provision for COE certification that all action necessary to carry out each component of the restoration plan is completed, and that the performance standards are achieved.

iv. Project data.

(1) Work cessation. Dates work ceased due to high flows, if any.

(2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria on pumps used to dewater work areas.

(3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

(4) Site preparation.

(a) Total cleared area – riparian and upland.

(5) Isolation of in-water work area, capture and release.

(a) Supervisory fish biologist – name and address.

[2] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(b) Methods of work area isolation and take minimization.
(c) Stream conditions before, during and within one week after completion of work area isolation.
(d) Means of fish capture.
(e) Number of fish captured by species.
(f) Release site and condition of all fish released.
(g) Any incidence of observed injury or mortality of listed species.

(6) Site restoration. Photo or other documentation that site restoration performance standards were met.

e. Annual report on site restoration monitoring. In addition to the 120-day implementation report, the grantee will submit an annual report to the COE and NOAA Fisheries by December 31 that includes the date of each visit to a restoration site or mitigation site, site conditions on that date, and any corrective action taken as a result of that visit. Reporting will continue from year to year until the COE certifies that site restoration or compensatory mitigation performance standards have been met.

f. Reinitiation contact. To reinitiate consultation, contact the Oregon Office of NOAA Fisheries, at the address above.

2. To implement reasonable and prudent measure #2 (construction-related activities), the COE shall:

a. Site restoration. Prepare and carry out a written site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Submit a copy of the written site restoration plan to the COE and to the Oregon Habitat Branch of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(a) Plant trees at a sufficient density to restore a complete and overhanging canopy.
(b) Trees should be of sufficient size, 2 to 3 inches in diamter, to assure protection from park uses.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the site restoration requirements, including providing and managing any financial assurances and monitoring necessary to ensure restoration success.

(2) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.
(a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.
(b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(3) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(4) Performance standards. Use these standards to help design the site restoration plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.
(a) Bare soil spaces are small and well dispersed.
(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.
(c) If areas with past erosion are present, they are completely stabilized and healed.

(d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.

(e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.

(f) Vegetation structure is resulting in rooting throughout the available soil profile.

(g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.

(h) High impact conditions confined to small areas necessary access or other special management situations.

(i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.

(j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(5) Work plan. Include a written work plan as part of the site restoration plan with sufficient detail to include a description of the following elements, as applicable.

(a) Boundaries for the restoration area.

(b) Restoration methods, timing, and sequence.

(c) Water supply source, if necessary.

(d) Woody native vegetation appropriate to the restoration site.[3] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.

(e) A plan to control exotic invasive vegetation.

(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.

(g) Geomorphology and habitat features of stream or other open water.

(h) Site management and maintenance requirements.

(6) Five-year monitoring and maintenance plan.

(a) A written schedule to visit the restoration site annually for 5 years or longer as necessary to confirm that the performance standards are achieved. Despite the initial 5-

[3] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

year planning period, site visits and monitoring will continue from year-to-year until the COE certifies that site restoration performance standards have been met.

(b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).

(c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

b. Hydraulic surveys. Hydraulic measurements that require access to the wetted channel will be done outside of the spawning season, or will have a fisheries biologist verify that there are no redds present at the site. If dye must be used, only non-toxic vegetable dyes is authorized; use of short pieces of plastic ribbon to determine flow patterns is not authorized.

c. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

d. Timing of in-water work. Complete all work below the bankfull elevation between July 15 and August 31, unless otherwise approved in writing by NOAA Fisheries.

e. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

f. Fish screens. Install, operate and maintain a fish screen according to NOAA Fisheries' fish screen criteria[4] on each water intake used for project construction, including pumps used to isolate an in-water work area. Screens for water diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized.

g. Fish passage. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by NOAA Fisheries, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

h. Pollution and Erosion Control Plan. Prepare and carry out a written pollution and erosion control plan to prevent pollution caused by surveying or construction operations. Submit a copy of the written plan to the COE and to the Oregon Habitat Branch of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

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[4] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

(1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.
(2) Practices to prevent erosion and sedimentation associated with construction sites, haul roads, equipment and material storage sites, fueling operations, and staging areas.
(3) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.
(4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.
(5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.
(6) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[5]
(1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.
(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

i. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows.
i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

[5] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the 2-year floodplain.

j. Preconstruction activity. Complete the following actions before significant[6] alteration of the project area.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[7]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

k. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document

[6] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[7] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

inspections in a record that is available for review on request by COE or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

l. Site preparation. Conserve native materials for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile any large wood[8], native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

m. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream of spawning habitats, completely isolate the work area from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NOAA Fisheries.

n. Capture and release. Before and intermittently during pumping to isolate an in-water work area, attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

ii. Do not use electrofishing if water temperatures exceed 18ºC.

iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[9]

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[8] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[9] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
v. Transport fish in aerated buckets or tanks.
vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.
vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.
viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.
ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

o. Earthwork. Complete earthwork (including excavation, dredging, filling and compacting) as quickly as possible.
i. Site stabilization. Stabilize all disturbed areas following any break in work unless construction will resume within four days.
ii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

p. Use of large wood and rock. Whenever possible, use large wood as an integral component of all streambank protection treatments.[10] Avoid or minimize the use of rock, stone and similar materials. Large wood will be intact, hard, and undecayed to partly decaying with untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found laying on the ground or partially sunken in the ground is not acceptable.

3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

[10] See, e,g, Washington Department of Fish and Wildlife, Washington Department of Transportation, and Washington Department of Ecology, *Integrated Streambank Protection Guidelines*, Appendix I:Anchoring and placement of large woody debris (April 2003) (http://www.wa.gov/wdfw/hab/ahg/ispgdoc.htm); Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (http://www.odf.state.or.us/FP/RefLibrary/RefsList.htm).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reason for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O.gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14

to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. The action area for this consultation includes the streambed, streambanks, and riparian area of Crystal Springs Creek from the Bybee Boulevard crossing downstream to the confluence with Johnson Creek. This area has been designated as EFH for various life stages of chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in the ESA portion of this consultation, the proposed activities would result in detrimental, short-term, adverse effects to a variety of habitat parameters.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will temporarily adversely affect the EFH for chinook salmon and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. In addition to conservation measures proposed for the project by the COE, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.3 and 2.2.4, respectively, of the ESA portion of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

The MSA (section 305(b)) and 50 CFR 600.920(j) requires the COE to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with NOAA Fisheries' conservation recommendations, the COE shall explain its reasons for not following the recommendations.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion in addition to the BA and additional information requested by NOAA Fisheries and provided by the COE.

Birtwell, I. K., G. F. Hartman, B. Anderson, D. J. McLeay, and J. G. Malick. 1984. "A Brief Investigation of Arctic Grayling (Thymallus arcticus) and Aquatic Invertebrates in the Minto Creek Drainage, Mayo, Yukon Territory: An Area Subjected to Placer Mining." Canadian Technical Report of Fisheries and Aquatic Sciences 1287.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* W.R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:83-138.

Busby, P. S. Grabowski, R. Iwamoto, C. Mahnken, G. Matthews, M. Schiewe, T. Wainwright, R. Waples, J. Williams, C. Wingert, and R. Reisenbichler. 1995. Review of the status of steelhead (*Oncorhynchus mykiss*) from Washington, Idaho, Oregon, and California under the U.S. Endangered Species Act.

Busby, P., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-27.

DeVore, P. W., L. T. Brooke, and W. A. Swenson. 1980. "The Effects of Red Clay Turbidity and Sedimentation on Aquatic Life In the Nemadji River System. Impact of Nonpoint Pollution Control on Western Lake Superior." S. C. Andrews, R. G. Christensen, and C. D. Wilson. Washington, D.C., U.S. Environmental Protection Agency. EPA Report 905/9-79-002-B.

Graham, J.C., and D.L. Ward. 2002. Distribution of fish in Portland tributary streams. Annual Report 2001-2002. Oregon Department of Fish and Wildlife, Prepared for the City of Portland.

Gregory, R. S., and C. D. Levings. 1998. "Turbidity Reduces Predation on Migrating Juvenile Pacific Salmon." Transactions of the American Fisheries Society 127: 275-285.

Gregory, R.S. 1993. Effect of turbidity on the predator avoidance behavior of juvenile chinook salmon (Oncorhynchus tshawytcha). Canadian J. Fish. Aquatic Sciences 50:241-246.

Gregory, S.V., F.J. Swanson, W.A. McKee and K.W. Cummins. 1991. An Ecosystem Perspective of Riparian Zones: Focus on links between land and water. BioScience 41(8): 540-551

Lloyd, D. S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. North American Journal of Fisheries Management 7:34-45.

Lloyd, D. S., J. P. Koenings, and J. D. LaPerriere. 1987. "Effects of Turbidity in Fresh Waters of Alaska." North American Journal of Fisheries Management 7: 18-33.

McLeay, D. J., G. L. Ennis, I. K. Birtwell, and G. F. Hartman. 1984. "Effects On Arctic Grayling (Thymallus arcticus) of Prolonged Exposure to Yukon Placer Mining Sediment: A Laboratory Study." Canadian Technical Report of Fisheries and Aquatic Sciences 1241.

McLeay, D. J., I. K. Birtwell, G. F. Hartman, and G. L. Ennis. 1987. "Responses of Arctic Grayling (Thymallus arcticus) To Acute and Prolonged Exposure to Yukon Placer Mining Sediment." Canadian Journal of Fisheries and Aquatic Sciences 44: 658-673.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-35, 443 p.

Neff, J.M. 1985. Polycyclic aromatic hydrocarbons. Pages 416-454 *in*: G.M. Rand and S.R Petrocelli. Fundamentals of aquatic toxicology. Hemisphere Publishing, Washington, D.C.

Newcombe, C. P., and D. D. MacDonald. 1991. "Effects of Suspended Sediments on Aquatic Ecosystems." North American Journal of Fisheries Management 11: 72-82.

NOAA Fisheries (National Marine Fisheries Service). 1996. Making Endangered Species Act Determinations of Effect for Individual or Groups of Actions at the Watershed Scale. NMFS Environmental and Technical Services Division. Portland, Oregon. August.

NOAA Fisheries (National Marine Fisheries Service). 1999. The Habitat Approach: Implementation ofSection 7 of the Endangered Species Act fo Actions Affecting the Habitat of Pacific Anadromous Salmonids. Guidance memorandum from Assistant Regional Administrators for Habitat Conservation and Protected Resources to staff. 3 pages. August. (Available @ www.nwr.noaa.gov , under Habitat Conservation Division, Habitat Guidance Documents).

ODFW (Oregon Department of Fish and Wildlife). 2000. Guidelines for timing of in-water work to protect fish and wildlife resources. Oregon Department of Fish and Wildlife, Portland, Oregon. June.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Redding, J. M., C. B. Schreck, and F. H. Everest. 1987. "Physiological Effects on Coho Salmon and Steelhead of Exposure to Suspended Solids." Transactions of the American Fisheries Society 116: 737-744.

Scannell, P.O. 1988. Effects of Elevated Sediment Levels from Placer Mining on Survival and Behavior of Immature Arctic Grayling. Alaska Cooperative Fishery Unit, University of Alaska. Unit Contribution 27.

Servizi, J. A., and Martens, D. W. 1991. "Effects of Temperature, Season, and Fish Size on Acute Lethality of Suspended Sediments to Coho Salmon". Canadian Journal of Fisheries and Aquatic Sciences 49:1389-1395.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. "Effects of Chronic Turbidity on Density and Growth of Steelheads and Coho Salmon." Transactions of the American Fisheries Society 113: 142-150. 1984.